

1      WHAT IS CLAIMED IS:

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1. A mobile communication system comprising:

10     a plurality of radio base stations forming respective radio zones and effecting a radio channel setting control in accordance with a predetermined procedure; and

15     a mobile station selecting, as a wait zone, one of the radio zones that satisfies a criteria demanded by the predetermined procedure, and receiving communication service via the selected wait zone,

20     each of the radio base stations comprising:

25     traffic control means for setting a traffic distribution for the plurality of radio zones; and

30     announcing means for generating announcement information including the order of priority assigned to the plurality of radio zones, the order of priority being assigned in accordance with a probability density given to each of the plurality of radio zones under the distribution set by the traffic control means, and for transmitting announcement information to the radio zone formed by the radio station to which the announcing means belongs,

35     the mobile station comprising:

means for receiving the announcement information transmitted by the announcing means in accordance with the predetermined procedure; and

wait control means for selecting one of the radio zones as a wait zone, the radio zone to which a highest priority is assigned being a first

1 candidate for selection by the wait control means.

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2. A mobile communication system comprising:

a plurality of radio base stations forming one or a plurality of radio zones and one or a plurality of small-scale radio zones, resulting in a hierarchy of overlapping radio zones, and effecting a radio channel setting control in accordance with a predetermined procedure; and

10 a mobile station accessing one of the radio zones formed by the respective one of the plurality of radio base stations, in accordance with a predetermined procedure, and receiving communication service via the accessed radio zone,

15 each of the plurality of radio base stations comprising:

20 announcing means for transmitting announcement information which includes identification information for identifying radio channels assigned to respective radio zones and small-scale radio zones, 25 via the radio channel assigned to the radio zone formed by the radio base station to which the announcing means belongs, the identification information being arranged in the announcement information so as to correspond to the hierarchy of 30 overlapping radio zones,

the mobile station comprising:

35 announcement information receiving means for receiving the announcement information transmitted by the announcing means, in accordance with the procedure for radio channel setting control;

measuring means for measuring an electric field intensity for the radio channel

1 corresponding to the identification information  
included in the announcement information received by  
the announcement information receiving means; and  
wait control means for comparing an  
5 electric field intensity measured by the measuring  
means with a preset threshold level, and designating a  
radio zone to which the radio channel lowest in the  
hierarchy is assigned as a wait zone in which to  
receive the communication service, on the condition  
10 that the electric field intensity measured by the  
measuring means exceeds the preset threshold level.

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*Q3.* A mobile communication system  
comprising:

a plurality of radio base stations  
forming one or a plurality of radio zones and one or a  
20 plurality of small-scale radio zones, resulting in a  
hierarchy of overlapping zones, and effecting a radio  
channel setting control in accordance with a  
predetermined procedure; and

a mobile station accessing one of the  
25 radio zones formed by the respective one of the  
plurality of radio base stations, in accordance with a  
predetermined procedure, and receiving communication  
service via the accessed radio zone,

each of the plurality of radio base  
30 stations comprising:

announcing means for transmitting  
announcement information which includes identification  
information for identifying the one or the plurality  
of radio zones and the one or the plurality of small-  
35 scale radio zones, via the radio channel assigned to  
the radio zone formed by the radio base station to  
which the announcing means belongs, the identification

- 1 information being arranged in the announcement information according to respective positions in the hierarchy of overlapping zones,  
the mobile station comprising:  
5 announcement information receiving means for receiving the announcement information transmitted by the announcing means, in accordance with the procedure for radio channel setting control;  
measuring means for measuring an  
10 electric field intensity for the radio zone corresponding to the identification information included in the announcement information received by the announcement information receiving means; and  
wait control means for comparing an  
15 electric field intensity measured by the measuring means with a preset threshold level, and designating, as a wait zone in which to receive the communication service, a radio zone lowest in the hierarchy of overlapping zones on the condition that the electric  
20 field intensity measured by the measuring means exceeds the threshold level.

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104. A mobile communication system comprising:  
a plurality of radio base stations forming one or a plurality of radio zones and one or a  
30 plurality of small-scale radio zones, resulting in a hierarchy of overlapping zones, and effecting a radio channel setting control in accordance with a predetermined procedure; and  
a mobile station accessing one of the  
35 radio zones formed by the respective one of the plurality of radio base stations, in accordance with a predetermined procedure, and receiving communication

- 1 service via the accessed radio zone,  
each of the plurality of radio base  
stations comprising:  
announcing means for transmitting  
5 announcement information which includes identification  
information for identifying radio channels for the one  
or the plurality of radio zones and the one or the  
plurality of small-scale radio zones, via the radio  
channel assigned to the radio zone formed by the radio  
10 base station to which the announcing means belongs,  
the identification information being arranged in the  
announcement information according to respective  
positions in the hierarchy of overlapping zones,  
the mobile station comprising:  
15 announcement information receiving  
means for receiving the announcement information  
transmitted by the announcing means, in accordance  
with the procedure for radio channel setting control;  
measuring means for measuring an  
20 electric field intensity for the radio channel  
corresponding to the identification information  
included in the announcement information received by  
the announcement information receiving means; and  
wait control means for comparing an  
25 electric field intensity measured by the measuring  
means with a preset threshold level, and designating  
one of the radio channels, which is assigned to the  
radio zone lowest in the hierarchy and for which the  
control means has determined that the electric field  
30 intensity measured by the measuring means exceeds the  
preset threshold level, as a radio channel via which  
to receive the communication service.

1 comprising:

5 a plurality of radio base stations forming one or a plurality of radio zones and one or a plurality of small-scale radio zones, resulting in a hierarchy of overlapping zones, and effecting a radio channel setting control in accordance with a predetermined procedure; and

10 a mobile station accessing one of the radio zones formed by the respective one of the plurality of radio base stations, in accordance with a predetermined procedure, and receiving communication service via the accessed radio zone,

15 each of the plurality of radio base stations comprising:

20 announcing means for transmitting announcement information which includes identification information for identifying the one or the plurality of radio zones and the one or the plurality of small-scale radio zones, via the radio channel assigned to the radio zone formed by the radio base station to which the announcing means belongs, the identification information being arranged in the announcement information according to respective positions in the hierarchy of overlapping zones,

25 the mobile station comprising:

30 announcement information receiving means for receiving the announcement information transmitted by the announcing means, in accordance with the procedure for radio channel setting control;

35 measuring means for measuring an electric field intensity for the radio zone corresponding to the identification information included in the announcement information received by the announcement information receiving means; and

wait control means for comparing an electric field intensity measured by the measuring means with a preset threshold level, and designating,

1 as a wait zone in which to receive the communication  
service, a radio zone identified by the identification  
information to be lowest in the hierarchy of  
overlapping zones, on the condition that the electric  
5 field intensity measured by the measuring means  
exceeds the threshold level.

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126. A mobile communication system  
comprising:

15 a plurality of radio base stations  
forming one or a plurality of radio zones and one or a  
plurality of small-scale radio zones, resulting in a  
hierarchy of overlapping zones, and effecting a radio  
channel setting control in accordance with a  
predetermined procedure; and

20 a mobile station accessing one of the  
radio zones formed by the respective one of the  
plurality of radio base stations, in accordance with a  
predetermined procedure, and receiving communication  
service via the accessed radio zone,

25 each of the plurality of radio base  
stations comprising:

30 announcing means for transmitting  
announcement information which includes first  
identification information for identifying a radio  
channel assigned to the radio zone formed by the radio  
base station to which the announcing means belongs, as  
well as including second identification information  
identifying the radio zones and the small-scale radio  
zones which overlap the radio zone formed by the radio  
base station to which the announcing means belongs,  
35 via the radio channel assigned to the radio zone  
formed by the radio base station to which the  
announcing means belongs, the second identification

- 1 information being arranged in the announcement information according to respective positions in the hierarchy of overlapping zones,  
the mobile station comprising:  
5 announcement information receiving means for receiving the announcement information transmitted by the announcing means, in accordance with the procedure for radio channel setting control;  
measuring means for measuring an  
10 electric field intensity for the radio channel corresponding to the identification information included in the announcement information received by the announcement information receiving means; and  
wait control means for comparing an  
15 electric field intensity measured by the measuring means with a preset threshold level, determining the radio channel which is identified by the associated second identification information, if available, to have a lowest hierarchical order, and designating, as  
20 a wait zone in which to receive the communication service, the radio zone to which the determined radio channel is assigned, on the condition that the electric field intensity measured by the measuring means exceeds the threshold level.

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13. A mobile communication system comprising:  
30 a plurality of radio base stations forming one or a plurality of radio zones and one or a plurality of small-scale radio zones, resulting in a hierarchy of overlapping zones, and effecting a radio  
35 channel setting control in accordance with a predetermined procedure; and  
a mobile station accessing one of the

- 1      radio zones formed by the respective one of the plurality of radio base stations, in accordance with a predetermined procedure, and receiving communication service via the accessed radio zone,
- 5      each of the plurality of radio base stations comprising:
- announcing means for transmitting announcement information which includes first identification information for identifying a radio
- 10     channel assigned to a radio zone formed by the radio base station to which the announcing means belongs, as well as including second identification information identifying the radio zones and the small-scale radio zones which overlap the radio zone formed by the radio
- 15     base station to which the announcing means belongs, over the radio zone formed by the radio base station to which the announcing means belongs, the second identification information being arranged in the announcement information according to respective
- 20     positions in the hierarchy of overlapping zones,
- the mobile station comprising:
- announcement information receiving means for receiving the announcement information transmitted by the announcing means, in accordance with the procedure for radio channel setting control;
- 25     measuring means for measuring an electric field intensity for the radio zone corresponding to the identification information included in the announcement information received by the announcement information receiving means; and
- 30     wait control means for comparing an electric field intensity measured by the measuring means with a preset threshold level, determining the radio zone corresponding to the radio channel which is identified by the associated second identification information, if available, to have a lowest hierarchical order, and designating the determined

1      radio zone as a wait zone in which to receive the communication service on the condition that the electric field intensity measured by the measuring means exceeds the threshold level.

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14/8. A mobile communication system  
10     comprising:

15     a plurality of radio base stations forming one or a plurality of radio zones and one or a plurality of small-scale radio zones, resulting in a hierarchy of overlapping zones, and effecting a radio channel setting control in accordance with a predetermined procedure; and

20     a mobile station accessing one of the radio zones formed by the respective one of the plurality of radio base stations, in accordance with a predetermined procedure, and receiving communication service via the accessed radio zone,

25     each of the plurality of radio base stations comprising:

30     announcing means for transmitting announcement information which includes a hierarchical (equal or subordinate) order of the radio zone formed by the radio base station to which the announcing means belongs with respect to the overlapping radio zones and small-scale radio zones, and which also includes identification information for identifying radio channels assigned to the radio zone formed by the radio base station to which the announcing means belongs and the overlapping radio zones and small-scale radio zones, via the radio channel assigned to the radio zone formed by the radio base station to which the announcing means belongs,

35     the mobile station comprising:

- 1 announcement information receiving  
means for receiving the announcement information  
transmitted by the announcing means, in accordance  
with the procedure for radio channel setting control,  
5 for extracting the identification information from the  
announcement information, and for determining the  
hierarchy of the radio zones to which the radio  
channels identified by the identification information  
are assigned;
- 10 measuring means for measuring an  
electric field intensity for the radio channel  
corresponding to the identification information  
obtained by the announcement information receiving  
means; and
- 15 wait control means for comparing an  
electric field intensity measured by the measuring  
means with a preset threshold level, and designating a  
radio zone to which the radio channel lowest in the  
hierarchy is assigned as a wait zone in which to  
20 receive the communication service, on the condition  
that the electric field intensity measured by the  
measuring means for the radio channel lowest in the  
hierarchy exceeds the preset threshold level.

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159. A mobile communication system  
comprising:

- 30 a plurality of radio base stations  
forming one or a plurality of radio zones and one or a  
plurality of small-scale radio zones, resulting in a  
hierarchy of overlapping zones, and effecting a radio  
channel setting control in accordance with a  
35 predetermined procedure; and  
a mobile station accessing one of the  
radio zones formed by the respective one of the

- 1        plurality of radio base stations, in accordance with a  
predetermined procedure, and receiving communication  
service via the accessed radio zone, each of the  
plurality of radio base stations comprising:  
5                announcing means for transmitting  
announcement information which includes a hierarchical  
(equal or subordinate) order of the radio zone formed  
by the radio base station to which the announcing  
means belongs with respect to the overlapping radio  
10      zones and small-scale radio zones, and which also  
includes identification information for identifying  
the radio zone formed by the radio base station to  
which the announcing means belongs and the overlapping  
radio zones and small-scale radio zones, over the  
15      radio zone formed by the radio base station to which  
the announcing means belongs,  
              the mobile station comprising:  
              announcement information receiving  
means for receiving the announcement information  
20      transmitted by the announcing means, in accordance  
with the procedure for radio channel setting control,  
for extracting the identification information from the  
announcement information, and for determining the  
hierarchy of the radio zones corresponding to the  
25      identification information;  
              measuring means for measuring an  
electric field intensity for the radio zone  
corresponding to the identification information  
extracted by the announcement information receiving  
30      means 14g; and  
              wait control means for comparing an  
electric field intensity measured by the measuring  
means with a preset threshold level, and designating a  
radio zone lowest in the hierarchy determined by the  
35      announcement information receiving means as a wait  
zone in which to receive the communication service, on  
the condition that the electric field intensity

1 measured by the measuring means for the radio zone  
lowest in the hierarchy exceeds the preset threshold  
level.

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3 10. The mobile communication system as  
claimed in claim 2, wherein said announcing means  
10 comprises means for adding, in the announcement  
information, preset threshold values individually  
provided for the radio zone formed by the radio base  
station to which the announcing means belongs and the  
overlapping radio zones and small-scale radio zones,  
15 resulting in a hierarchy that corresponds to the  
hierarchy of overlapping zones, and  
said wait control means employs the  
threshold values added to the announcement information  
by the announcing means in making comparisons with the  
20 electric field intensity.

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4 11. The mobile communication system as  
claimed in claim 2 wherein announcing means comprises  
means for adding a relative value indicating the  
preset threshold value for the zone formed by the  
radio base station to which the announcing means  
30 belongs, in the form of a difference with respect to a  
reference value for the threshold value, and  
said announcement information receiving  
means includes means for determining the relative  
value added to the announcement information, in  
35 relation to the radio zone in which the announcement  
information is received, and  
said wait control means compares the

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- 1 electric field intensity measured by the measuring  
means with a sum of the reference value and the  
relative value determined by the announcement  
information receiving means in relation to the radio  
5 zone in which the electric field intensity is  
measured.

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512. The mobile communication system as claimed in claim 2, wherein said announcing means comprises means for adding relative values indicating the preset threshold values for the radio zone formed by the radio base station to which the announcing means belongs and the overlapping radio zones and small-scale radio zones, in the form of differences with respect to a reference value common to the threshold values, resulting in a hierarchy that corresponds to the hierarchy of overlapping zones, and

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413. The mobile communication system as  
claimed in claim 2, wherein said mobile station  
comprises zone determination means for performing a  
cyclic measurement of the electric field intensity of  
the radio zones in which the mobile station can be  
located, comparing a measured electric field intensity  
with a lower acceptance value by which an entry into  
the radio zone is enabled, stopping processes of  
measurement and comparison when it is found that the  
former exceeds the latter, and selecting the

1 associated radio zone as a candidate in which the  
announcements information receiving means is to receive  
the announcement information.

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7 14. The mobile communication system as  
claimed in claim 2, wherein said wait control means  
10 compares the electric field intensity measured by the  
measuring means with the threshold value in the  
descending order in the hierarchy of the radio zones  
subject to the measurement, and designates the radio  
zone for which it is found that the former exceeds the  
15 latter as a wait zone.

20 8 15. The mobile communication system as  
claimed in claim 13, wherein said measuring means  
comprises means which omits a measurement of the radio  
zone selected by the zone determination means and  
substitutes therefor the electric field intensity  
25 measured by the zone determination means.

30 16. A mobile station comprising:  
announcement information receiving  
means for receiving announcement information including  
orders of priority assigned to radio zones formed by a  
plurality of radio base stations, the reception by the  
35 announcement information receiving means being  
conducted according to a descending order of preset  
traffic distribution and in accordance with a radio

1 channel setting control procedure;

5 wait means for determining whether the  
radio zone associated with the order of priority  
included in the announcement information received by  
the announcement information receiving means satisfies  
a criteria adapted for the radio channel setting  
control procedure, and for designating the radio zone  
for which an affirmative answer is given as a wait  
zone; and

10 communication control means which  
receives communication service from the radio base  
station forming the radio zone designated by the wait  
means.

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17. A mobile communication system  
comprising:

20 a plurality of base stations forming  
respective radio zones that overlap each other;

a mobile station transportable between  
said radio zones; wherein

25 comprises:  
each of said plurality of base stations

announcing means for sending  
announcement information including an order of  
priority of said plurality of base stations to the  
mobile station located in one of said radio zones, and

30 said mobile station comprises:

control means for selecting the base  
station to which a request for a message channel is to  
be issued, based on the order of priority of the base  
stations included in the announcement information  
transmitted from said plurality of base stations.

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1        18. The mobile communication system as  
claimed in claim 17, wherein said mobile station  
further comprises:

5              announcement information receiving  
means for receiving the announcement information  
including the order of priority of said plurality of  
base stations and transmitted from said plurality of  
base stations; and

10          transmission means for issuing a  
request for a message channel to the base station  
selected by said control means.

15        *219.* The mobile communication system as  
claimed in claim 17, wherein said mobile station  
further comprises:

20          storage means for storing the  
announcement information;

25          measuring means for measuring a  
reception level in reception-level determining  
channels in a descending order of priority of said  
plurality of base stations, based on the announcement  
information stored in said storage means and including  
the order of priority and based on information  
relating to the reception-level determining channels.

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*23* *20.* The mobile communication system as  
claimed in claim *19*, wherein said control means  
includes determining means for determining whether the  
35          reception level in a reception-level determining  
channel is equal to or exceeds a predetermined level  
that enables a request for a message channel.

1           ~~24~~<sup>21</sup>. The mobile communication system as  
claimed in claim 17, wherein said announcing means  
includes first arranging means for ordering the  
announcement information so as to arrange information  
5           relating to reception-level determining channels in a  
descending order of priority.

10           ~~25~~<sup>22</sup>. The mobile communication system as  
claimed in claim 17, wherein said announcing means  
includes second arranging means for ordering the  
announcement information so as to couple information  
15           relating to each reception-level determining channel  
to an order of priority associated therewith.

20           ~~19~~<sup>23</sup>. The mobile communication system as  
claimed in claim 18, wherein said transmission means  
includes first transmission means for issuing a  
request for a message channel to the base station  
25           selected by the control means when a call is  
originated.

30           ~~20~~<sup>24</sup>. The mobile communication system as  
claimed in claim 18, wherein said transmission means  
includes second transmission means for issuing a  
request for a message channel to the base station  
35           selected by the control means when a call is incoming.

1        21 25. The mobile communication system as  
claimed in claim 18, wherein said transmission means  
includes third transmission means for transmitting a  
request for a communication to the base station  
5        selected by the control means when a message channel  
is switched from one to another in the event of a  
handover of a call.

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~~26. A mobile station for use in a mobile communication system, comprising control means for selecting a base station to which a request for a message channel is to be issued, based on an order of priority of a plurality of base stations included in announcement information from said plurality of base stations.~~

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27. The mobile station as claimed in  
claim 26, further comprising:  
announcing information receiving  
means for receiving, from said plurality of base  
stations, the announcement information including the  
order of priority of said plurality of base stations;  
and  
30        transmission means for transmitting a  
request for a message channel to the base station  
selected by said control means.

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31 28. The mobile station as claimed in

1 claim 26, further comprising:  
storage means for storing the  
announcement information;  
measuring means for measuring a  
5 reception level in reception-level determining  
channels in a descending order of priority of said  
plurality of base stations, based on the announcement  
information stored in said storage means and including  
the order of priority and based on information  
10 relating to the reception-level determining channels.

15 *31* *32* *29*. The mobile station as claimed in  
claim *28*, wherein said control means includes  
determining means for determining whether the  
reception level in a reception-level determining  
channel is equal to or exceeds a predetermined level  
20 that enables a request for a message channel.

25 *28* *30*. The mobile station as claimed in  
claim 27, wherein said transmission means includes  
first transmission means for issuing a request for a  
message channel to the base station selected by the  
control means when a call is originated.

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35 *29* *31*. The mobile station as claimed in  
claim 27, wherein said transmission means includes  
second transmission means for issuing a request for a  
message channel to the base station selected by the

1 control means when a call is incoming.

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10 32. The mobile station as claimed in  
claim 27, wherein said transmission means includes  
third transmission means for transmitting a request  
for a communication to the base station selected by  
the control means when a message channel is switched  
from one to another in the event of a handover of a  
call.

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20 33. A base station forming a radio zone  
that overlaps radio zones formed by other base  
stations in a mobile communication system;  
announcing means for sending  
announcement information including an order of  
priority of a plurality of base stations constituting  
the mobile communication system to a mobile station  
located in one of the radio zones.

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30 34. The base station as claimed in  
claim 33, wherein said announcing means includes first  
arranging means for ordering the announcement  
information so as to arrange information relating to  
reception-level determining channels in a descending  
order of priority.

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1           35. The base station as claimed in  
claim 33, wherein said announcing means includes  
second arranging means for ordering the announcement  
information so as to couple information relating to  
5           each reception-level determining channel to an order  
of priority associated therewith.

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